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(12) **United States Patent**  
**Hart**(10) **Patent No.:** **US 6,732,054 B2**(45) **Date of Patent:** **May 4, 2004**(54) **PROCESS FOR IDENTIFYING SINGLE CRYSTALS BY ELECTRON DIFFRACTION**(75) Inventor: **Haskell Vincent Hart**, Katy, TX (US)(73) Assignee: **Shell Oil Company**, Houston, TX (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 53 days.

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**Related U.S. Application Data**

(60) Provisional application No. 60/333,583, filed on Nov. 27, 2001.

(51) **Int. Cl.<sup>7</sup>** ..... **H01J 37/28**(52) **U.S. Cl.** ..... **702/28; 250/305; 378/73**(58) **Field of Search** ..... 702/28; 250/305, 250/307, 310, 311; 378/73, 86(56) **References Cited****U.S. PATENT DOCUMENTS**

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A relational database is built and used for the identification of single crystals by electron diffraction. Selected area electron diffraction (SAED) patterns (a lattice net of spots) produced in an electron diffractometer or a transmission electron microscope (TEM) are matched against database patterns calculated from reduced unit cells of known materials. The effects of double diffraction on electron diffraction patterns are fully incorporated into the database by rigorous calculation.

**6 Claims, No Drawings**